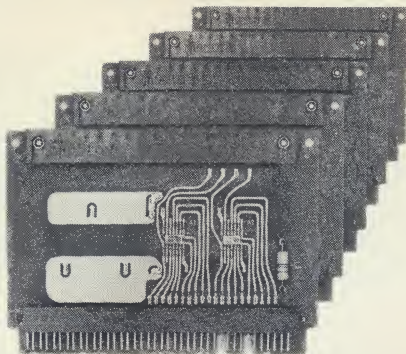




SERIES 5

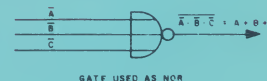
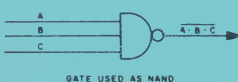
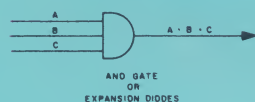
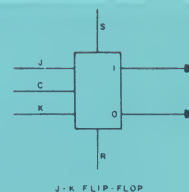
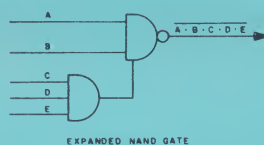
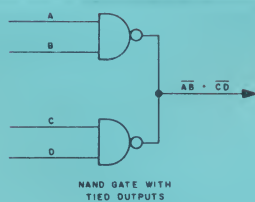


INTEGRATED CIRCUIT LOGIC CARDS

New low-priced MONILOGIC Series 5 Integrated Circuit Logic Cards offer data systems engineers a unique combination of features unequaled by any competing line. In addition to the standard benefits derived from integrated circuit usage (e.g. smaller size, greater reliability, lower power requirements), MONILOGIC reduces design and assembly time and lowers check-out and maintenance costs by providing the following high-performance advantages:

- DTL silicon integrated circuits in flat-pack form
- DC coupled NAND/NOR logic with J-K flip-flops
- Asynchronous operation to 5,000,000 pulses/second
- 5-Volt signal swings
- Noise rejection in excess of 1 volt
- Low power consumption
- High fan-in and fan-out
- Temperature range 0°C to 70°C
- System oriented etched cards
 - conventional two-sided construction,
 - up to 30 microcircuit elements
 - 16 easily accessible test points
 - 40 terminal hermaphroditic connector
- High-capacity rack-mountable assemblies
 - up to 96 cards
 - sliding drawer construction
 - 5 1/4" front panel height
 - solderless interconnections

ELEMENTARY FUNCTIONS



LOGIC DIAGRAM SYMBOLS



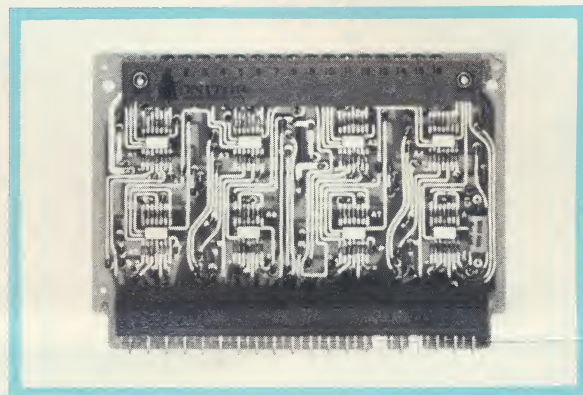
PHONE 215-646-8100
TWX 215-646-9399

FORT WASHINGTON, PENNSYLVANIA, 19034



MONILOGIC Series 5 Inter

MONILOGIC Series 5, through its highly efficient use of integrated circuit elements, coupled with ample card size and large terminal capacity, facilitates realization of a wide range of system elements in a minimum number of card types. The flexibility and economy embodied in ample input gate expansion, high fan-out, short propagation delays, and high noise thresholds make MONILOGIC cards ideal building blocks for the design and implementation of digital instruments and systems.



Since rapid-switching Diode Transistor Logic is used throughout, MONILOGIC is operable in realistically large multi-stage arrays at clock rates beyond 5 million pulses per second. Typical characteristics of the universal NAND gate are: Delay—25 nanoseconds, Rise Time—75 nanoseconds, Fall Time—40 nanoseconds.

■ **LOADING** Because MONILOGIC series 5's microcircuit elements are all in the Diode Transistor Logic family, only one type of load is presented within a MONILOGIC system. The load is quantized into unit loads defined as 1.2 milliamperes of conventional current flowing out of the driven terminal. Each input and output on MONILOGIC cards has a prescribed load or load-driving capability, designated on the card logic diagrams by a parenthetical number indicating unit loads. Where external-system interfaces are contemplated, actual current and directions of flow are prescribed.

■ **SIGNAL LEVELS** Since the transition region between Logic 0 ($+0.3 \pm 0.2$ v) and Logic 1 ($+5 \pm 1$ v) is typically from 1.0 to 1.5 volts, each MONILOGIC Series 5 system possesses excellent noise immunity. Use of a MONILOGIC voltage regulator, available on a standard card, assures that the collector supply will be maintained at the preferred +5 volts within ± 0.2 volts. Except on cards which are used at external interfaces of a logic system, the collector supply is the only voltage required. Other voltages for miscellaneous use are provided by centralized regulated supplies.

SPECIFICATIONS

Operating Rate 0 to 5,000,000 fps
Output Rise Times 75 nanoseconds
Output Fall Times 40 nanoseconds
Propagation Delay Times 25 nanoseconds
Logic Levels Zero: 0 to 0.3 v, One: V_c

Noise Rejection in excess of 1.0 volt
Temperature Range 0°C to 70°C
Dimensions 3.3" x 4.65"
Mating Connector 40 Pin Elco Varicon
Supply Voltage (V_c) +5 volts $\pm 20\%$

■ **LOGIC FUNCTIONS** MONILOGIC Series 5's dominant static logic entity, the NAND gate, performs the NOR function for complementary signals. NAND gates are available with up to four inputs. Some types provide external access to the gate node so that the number of inputs may be expanded. In addition, gate inputs may be directly linked to provide an economical OR function. The basic MONILOGIC storage element, the J-K flip-

flop, serves as a binary counter stage with no external gating.

■ **DC COUPLING** Clock inputs to MONILOGIC Series 5's flip-flops depend solely upon DC logic levels, and are independent of rise and fall times. Because of this DC coupling, MONILOGIC's flip-flops can receive inputs with very slow rise and fall times and still operate without degradation of performance.

Integrated Circuit Logic Cards

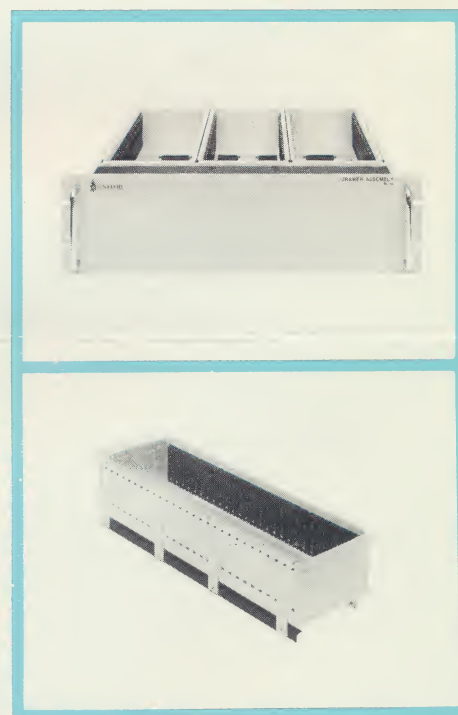
■ **CARD TYPES** Basic to the comprehensive flexibility of the MONILOGIC Series 5 line is the wide range of standard card types available on an off-the-shelf basis:

TYPE	DESCRIPTION	TYPE	DESCRIPTION	TYPE	DESCRIPTION
A51	8-bit Digital-Analog Converter (pos. ref.)	G55	Six Exclusive-OR Gates	M54	Two 3-bit Decoders with Drivers
A53	PCM Current Switch Comparator	G56	Nineteen Inverters	M55	Two 3-bit Decoders, Low Impedance Drive
A54	Eleven Current Switches	G57	Eighteen Inverter Drivers	Q50	Clock
A55	PCM Allowable Error Switch	G58	Eight NAND Gates (3 & 4 input)	Q51	Crystal Oscillator
A56	Two DC Amplifiers	G59	Sixteen non-inverting transfer gates	Q52	Voltage Controlled Oscillator
C52	Two 4-bit Binary Counters	G60	Gated Mixer (Eight 3-input gates)	R50	Two 4-bit Storage Registers
C53	Two 4-bit Counters, BCD or Binary	G61	Twelve Exclusive-OR Gates	R51	Two 4-bit Shift Registers
C54	4-bit Up-Down Counter, BCD or Binary	G62	Eleven NAND Gates (2 & 3 input)	R52	12-bit Assembly Register
D50	Three Delay Flops	L50	Sixteen Down-Shifters	R53	4-bit Binary to BCD Converter
E50	Eight 3-input and one 4-input Expander	L51	Sixteen Up-Shifters	U51	Utility Card for any three 14-lead flat packs, power connections compatible with MONILOGIC Series 5 Cards (installed by customer)
F50	Five J-K Flip-Flops	L52	Eight Gated Lamp Drivers	U52	Utility Card for any two 14-lead flat packs, power connections compatible with MONILOGIC Series 5 Cards (installed by customer)
G50	Two 4-bit Comparators	L53	Four Schmitt Triggers		
G51	Four 4-bit Transfer Gates	L54	Twelve Relay or Lamp Drivers		
G53	Four Expandable NAND Gates plus 3-input and 5-input Expander	L55	Clock Distributor for Q52		
G54	Eight Expandable NAND Gates with Drivers	M50	Two BCD/decimal Converters		
		M51	Two BCD/decimal Converters with Drivers		
		M52	Four bit to sixteen Line Decoder		
		M53	Two 3-bit Decoders		

COMPANION SERIES: SERIES 1 features the same DTL devices as Series 5, but on cards with 62 pin AMP connectors which afford greater functional capacity. SERIES 3 features high-speed emitter-coupled integrated circuit devices on cards with 62 pin AMP connectors, for operation at rates up to 15,000,000 pulses/second.

■ **ACCESSORIES** Enhancing MONILOGIC Series 5's basic functional efficiency is a completely compatible line of specially designed auxiliary equipment. ■ The all-solid-state MONILOGIC POWER SUPPLIES, featuring current limiting and over-voltage protection, afford reliable supply voltages with only $\pm 3\%$ worst case variation. ■ The MODEL M108 DRAWER ASSEMBLY, occupying a panel space $5\frac{1}{4}$ " high by $16\frac{1}{8}$ " deep, houses up to 66 standard MONILOGIC cards in three separate MONIPAK files holding up to 22 cards each. ■ The MODEL M109 DRAWER ASSEMBLY, occupying a panel space $5\frac{1}{4}$ " high by $22\frac{1}{8}$ " deep, houses up to 96 cards in three separate MONIPAKS holding up to 32 cards each. Both the M108 and the M109 are mountable in standard EIA racks, and feature optional rear-mounted cable retractors. ■ The MODEL 871 CARD TESTER, containing its own clocks, power supplies, logic levels and circuit loads, provides a complete checkout for all MONILOGIC card types in less than 15 seconds per card. ■ The MONILOGIC Series 5 INSTRUCTION MANUAL serves as a comprehensive reference source for circuit schematics, engineering drawings, and design and application theory. ■ The Series 5 CARD EXTENDER is a specially designed accessory which makes MONILOGIC cards accessible for test and measurement while the cards are still in use. Removal of the cards from their MONIPAK and/or Drawer Assembly is facilitated by the easy-to-handle Series 5 CARD PULLER.

COMPLETE CAPABILITY for the design and production of special logic circuits and card configurations is available at all times to MONILOGIC users. MONITOR's extensive experience as a digital and analog data systems specialist affords additional application engineering support.



MONITOR
SYSTEMS INC.
FORT WASHINGTON, PENNSYLVANIA

The  MONILOGIC Series 5 Integrated Circuit Logic Card line is another use-proven product of MONITOR Systems Inc.



MONITOR specializes in analog and digital data systems for aerospace applications. Emphasis is on PCM Telemetry for which MONITOR has outstanding capability and experience. An extensive product engineering program has yielded high-performance components, such as MONILOGIC, which are available separately as system building blocks.

Housed in a well-instrumented 25,000 square-foot plant, MONITOR has the staff and facilities for quick-reaction delivery of reliable, versatile equipment incorporating the latest technological advances.

Customers for MONITOR systems and components include the Air Force, Army, Navy, NASA, and major prime contractors.

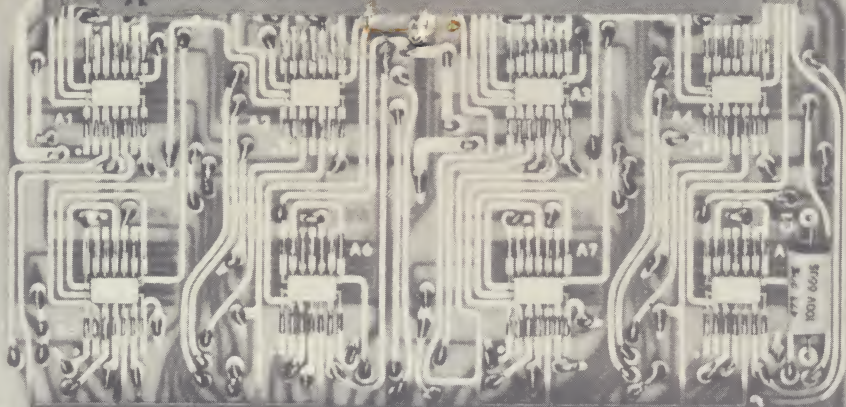


PHONE 215-646-8100
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